2010 Consortium Workshop Summary

Tanacross Shaded Fuel Break—Treatment in Action

In 2001, the Village of Tanacross partnered with the Tanana Chiefs Conference, BLM – Alaska Fire Service, Alaska Division of Forestry, and US Fish and Wildlife Service to begin a proactive and coordinated approach to hazardous fuels reduction. Through this unique interagency effort, BLM – Alaska Fire Service was able to obtain funding from the National Fire Plan to implement shaded fuel breaks around the potentially high risk community of Tanacross. This partnership also provided training and employment opportunities for local residents.

Approximately 52 acres of predominantly white spruce forest were thinned to 15 x 15 foot spacing and low branches (ladder fuels) were limbed. Three monitoring plots were also installed to assess vegetation changes within the fuel break. (More information on the effects of thinning on stand dynamics can be found in the 2009 Tanacross Monitoring Project Report linked below.)

In late May 2010, this shaded fuel break treatment was put to the test by the Eagle Trail Fire. Although the fuel break was not directly impacted by the head fire, it played a key role in operational decisions and resource allocations. By opening the canopy, fire fighters were able to function efficiently and conduct a burnout from the edge of the fuel treatment. The fuel break also altered the community's perception of risk, allowing them to react calmly in a stressful and potentially dangerous situation.

Speakers:
Tami DeFries (BLM)
Hans Smith (DOF)
Eric Miller (BLM)

Key Discussion Points & Questions:

- There is no "one size fits all" prescription for fuel treatments. There are many factors that need to be considered to minimize adverse impacts and maximize treatment effectiveness.
- Most of the grass cover within the Tanacross fuel break is not continuous and would also limit surface fire spread.
- There are still many unknowns in discussing shaded fuel break treatments including, the minimum and maximum effective spacing, maintenance, duration of effectiveness, methods of treatment, regeneration, and stand type conversion goals.
- The village of Tanacross is a very proactive and "fire aware" community. The installation of a shaded fuel break around the community in combination with Firewise practices around individual homes proved to be very beneficial, allowing fire fighters to effectively execute suppression tactics.

Additional Information:

1. View the presentation slides (pdf) or the recording (wav) on the Consortium website at: http://frames.nbii.gov/alaska/consortium/workshops/oct2010
2. Tanacross Shaded Fuel Break Project information on FIREHouse: http://depts.washington.edu/nwfire/project.php?projectID=501&microweb=0
3. 2009 Tanacross Shaded Fuel Break Monitoring Report: http://frames.nbii.gov/documents/alaska/workshops/TANACROSS_2009_SUMMARY.pdf

Photo (Right): Installation of the shaded fuel break around the Village of Tanacross. Photo from Tami DeFries.

Nenana Ridge Project Update—What have we learned so far?

Speakers
Scott Rupp (UAF)
Robert Schmoll (DOF)

The Nenana Ridge Experimental Fuels Treatment Project was funded by the Joint Fire Science Program and designed to quantify the effects of fuels reduction treatments on fire behavior and post-fire vegetation dynamics in Alaska black spruce. This project began in 2006 with installation of four 1-acre treatment blocks. Two blocks were thinned to 8 x 8 foot spacing and limbed, one was shearbladed, and one was shearbladed and windrowed. These four blocks were replicated in the adjacent forest unit, with the intent to burn each unit separately.

On June 17, 2009, the Nenana Ridge Prescribed Fire was ignited in Unit A. The burn had marginal success in the lower, wetter half of the unit but picked up momentum as weather improved and ignitions proceeded up the slight slope. A crown fire was attained and impacted both shearbladed treatments and one of the thinned treatments.

Pre-fire vegetation data and fuel moistures were collected along with duff (organic mat) consumption measurements. Fire proof camera boxes and sensor packages designed to collect data on air temperature, heat energy transfer, and air flow were installed to monitor fire behavior. Aerial infrared images (used to sense heat) were also collected from a helicopter.

The most important result from this experiment showed that the active crown fire was brought down to a surface fire, burning only 50 to 100 feet into the thinned treatment after initial impact. The canopy tree density was not high enough to support a crown fire and the elimination of ladder fuels limited individual tree torching. Although the surface fire continued to smolder for several days, ground fuels were not sufficient to carry fire through the entire treatment and stopped 200 feet within the border. Preliminary results also found that less of the forest floor (duff) was consumed in the thinned treatment than in the control (unaltered forest).

The 2009 Nenana Ridge Prescribed Burn proved to a successful but complex operational and logistical accomplishment. Funding for treatment installation and burn implementation was provided by local agencies, totaling over $385,000. Lessoned learned from the fire management perspective include effectiveness of the treatments, specifications for future fuel treatments, operational improvements, and sufficient funding needed for burn implementation. The completion of this project and the results are very important to the fire management and research communities. Project investigators and collaborators are continuing to seek funding to burn the remaining research unit in 2012.

Photo (Above): Edge of thinned fuel treatment. The crown fire dropped from the canopy to the ground, only burning several feet into the treatment at this location. Photo from Robert Schmoll.

Key Discussion Points & Questions:

- What happened in the shearbladed units? Remnants of organic materials scraped up during the shearblading process smoldered and were completely consumed.
- The shearbladed treatments were not intended to stop a fire but promote long term effects like stand type conversions from black spruce to hard woods.
- Fairbanks Area Forestry is currently implementing a combination of shaded fuel breaks and shearbladed treatments around designated areas.
- Which factor is most important in determining treatment effectiveness, tree spacing or elimination ladder fuels (limbing)?
- What factors prevented the surface fire from continuing to creep through the entire thinned treatment? Possibly duff moisture/surface fuel moisture and discontinuous grass.

Additional Information:

1. View the presentation slides (pdf) or the recording (wav), on the Consortium website at: http://frames.nbii.gov/alaska/consortium/workshops/oct2010
2. Nenana Ridge Experimental Treatment Project Proposal: http://depts.washington.edu/nwfire/proposal/06-2-1-39_proposal.pdf
3. Prescribed burn video created by the USFS Rocky Mountain Research Station Fire Sciences Lab: http://youtu.be/1Qkia5n2g4k

Fuels Forum—What projects are going on in your neck of the woods?

Group Discussion

Photo from Robert Schmoll.

- Fairbanks Area Forestry is currently implementing a combination of shaded fuel breaks and shearbladed treatments around designated areas.
- The Bureau of Indian Affairs (BIA) has been working with the community of Gulkana to install fuel breaks and utilize the biomass for energy production.
- The Kenai Wildlife Refuge is involved in project to convert spruce to hardwood stands to improve moose browse and wildlife viewing. Approximately 120 acres have already been cleared with some piles remaining to be burned. They plan to broadcast burn the remaining block next summer.
- Superior Pellet Fuels in North Pole is looking for opportunities to utilize unwanted biomass from local treatment projects.

- The Kenai Borough, US Fish & Wildlife Service, and Division of Forestry have recently funded a research project to evaluate the effects of various treatments (mowing, weed wacking, herbicide use, and mulching) on prevention and mitigation of bluejoint grass (*Calamagrostis canadensis*) establishment and growth.
- The Military Zone continues to build its prescribed fire program, utilizing burn modules on a rotating schedule. If anyone is interested in participating in the spring prescribed fires, contact Tom St. Clair (Military Zone Fuels Specialist).
- The US Army has been looking at several different types of fuels treatments including chipping, mastication, and vegetation clumping.

Photo from Randi Jandt.

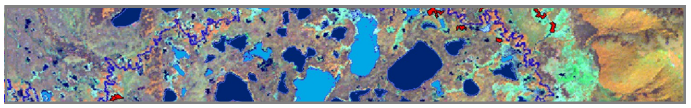
Photo from Tami DeFries.

- The BIA and Tanana Chiefs Conference (TCC) have completed shaded fuel break treatments in Healy Lake, Dot Lake, Alatna, Hughes, Minto, Allakaket, Nikolai, and other villages across the state. The Tanacross shaded fuel break project has served as template for many of these treatments. These fuel breaks are directly adjacent to the communities and also tie into other fire barriers (air strips, rivers, etc). Contracts have been developed with the Village Councils to provide employment opportunities for fuel break construction and TCC has provided on the job training. Treatments have also been constructed around cultural sites.
- Suggestions were brought up to investigate previous efforts to improve the National Fire Plan layer on the ArcIMS mapping site (AICC webpage). This site could provide one consolidated place to find state wide fuels treatment projects. A mechanism to update and improve this fuel treatment layer needs to be developed.
- Chugachmiut has been working on the Kenai Peninsula to promote and utilize Firewise practices around individual properties to improve defensibility.

Photo (Above): Tanacross shaded fuel break with burnout from 2010 Eagle Trail Fire shown at the far right. (Photo by Eric Miller)

Climate Change in Alaska

Speaker
Scott Rupp (UAF)



Climate change has been an on-going process here in Alaska, showing some significant changes in the last half century. In general, the largest changes in surface air temperature in the northern hemisphere have occurred in the winter season, between 1 and 4°C (from 1957-2006). If we look closer at Alaska, the change in the average seasonal temperature over the last 58 years is even more pronounced, particularly in the winter. Some locations, including Bettles and Big Delta, have seen an increase of 8-9° F.

The Pacific Decadal Oscillation (PDO), a large scale atmospheric circulation pattern, strongly impacts summer temperatures in Alaska. This pattern shifts back and forth causing warm and cold phases on a longer decadal scale. Research by Paul Duffy has shown strong linkages between larger scale circulations patterns (like the PDO) and summer weather conditions and how that relates to total area burned.

Annual precipitation trends on a global scale show a general increase, particularly at higher latitudes. Fairbanks has experienced a slight decline in annual precipitation and a slight increase in annual snowfall (from 1915-2007). Communities farther north, like Barrow, have seen a significant change in snow end dates, with snow melting 15-30 days earlier than in 1950.

The average monthly arctic sea ice extent has decreased approximately 10% per decade since 1978. This can potentially have a big impact on future fire, especially on the north slope. Implications for more open water in the summer have some very strong impacts on regional weather. Recent research looking at charcoal records near Anaktuvuk showed that within the last 10,000 years, there has never been another fire similar to the size and extent of the 2007 Anaktuvuk River Fire. Strong linkages were found between the timing of the Anaktuvuk River Fire and the impact of open sea ice on weather.

Climate has also been strongly linked to vegetation productivity. Shrub expansion has been documented in northern shrub tundra regions in Alaska. We know from previous paleo-ecology research that shrub dominated tundra ecosystems have shown higher fire activity. Not only has Alaska been experiencing temperature warming, we have also seen an increase of anywhere between 20-50% in growing season length. In terms of hydrology and linkages to vegetation, Alaska has seen significant drying of shallow lakes across the state.

In general, all climate prediction models are projecting continued increases in seasonal temperatures. Precipitation is also predicted to increase, though the impact on Alaska seems relatively minor. From looking at predicted evaporative demand, it is most likely that increases in temperature will outweigh any increase precipitation. Alaska will most likely experience a drier environment, particularly in the summer time.

Key Discussion Points & Questions:

- Our top ten fire years, in terms of area burned, are closely linked to PDO phase shifts.
- Suggestions were made to hold a webinar on the PDO and how it relates to potential seasonal fire activity. The Consortium will also work with ACCAP (Alaska Center for Climate Assessment and Policy) to disseminate applicable climate change information to the fire community.
- We need to consider changes in inter-annual variability, the distribution of extreme events, and the PDO when thinking about impacts to seasonal events like fire.
- We also need to think about how changes in vegetation structure will likely effects the fuels on the landscape.
- There is a newly funded project with DOD and UAF that will begin to look at linkages between permafrost, climate, and fire. One of the biggest linkages will be the impacts of fire speeding up the process of permafrost thaw and thermokarsting and what will come into the disturbed sites. This project will also look at how fuel treatments change soil dynamics in permafrost areas.

Additional Information:

1. View the presentation slides (pdf) or a recording (wmv) on the Consortium website at: http://frames.nbii.gov/alaska/consortium/workshops/oct2010
2. Alaska Center for Climate Assessment and Policy (ACCAP): http://ine.uaf.edu/accap
3. Alaska Climate Research Center: http://climate.gi.alaska.edu/
4. Paul Duffy's presentation on "Early Season Forecasting of Annual Area Burned in Interior Alaska" at 2009 Consortium Workshop: http://frames.nbii.gov/documents/alaska/workshops/20091016_duffy_presentation.pdf
5. Tundra burning in Alaska: Linkages to climate change and sea ice retreat (2010): http://www.agu.org/journals/jg/jg1004/2009JG001270/2009JG001270.pdf
6. Shrinking ponds in subarctic Alaska based on 1950-2002 remotely sensed images (2006): http://www.agu.org/journals/jg/jg0604/2005JG000150/2005JG000150.pdf
7. Fire behavior, weather, and burn severity of the 2007 Anaktuvuk River tundra fire, north slope, Alaska (2009): http://instaar.metapress.com/content/q3440542373153j2/fulltext.pdf

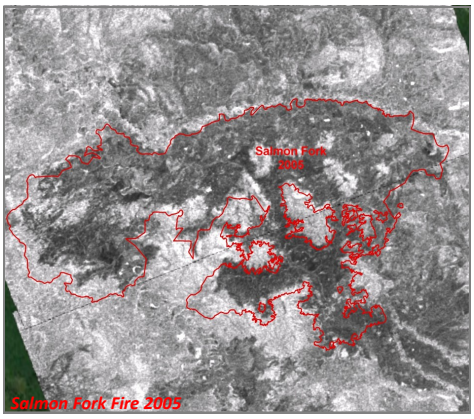
ACCAP Alaska Center for Climate Assessment & Policy

Fire Mapping Methods Using SAR

Speaker
Hilary Rigby (BLM)

SAR (Synthetic Aperture Radar) is a microwave that actively scans the earth's surface and shows surface soil moistures. The difference in moisture absorption between healthy green vegetation and burned damaged vegetation is easily distinguishable on a SAR image. This distinction allows fire scars in boreal forests to be delineated.

There are some advantages of using SAR imagery including the ability to penetrate through clouds (unlike Landsat), little to no limitations from atmospheric conditions, smaller file sizes for storage purposes, and faster processing time. There are also some disadvantages to using this type of imagery. Mountainous terrain makes fire scar delineation difficult with only one image so multiple images must be acquired. Fire scars in wetlands are difficult to identify due to the abundance of standing water. The season also impacts fire scar recognition. During very dry times of the year, there is not enough moisture on the ground to differentiate between burned and unburned fuels.



The initial assessment of using SAR images for end of season fire scar mapping indicated that both a combination of SAR and Landsat 5/7 images should be used to finalize digitized perimeters when needed. The quick processing time and small file size of SAR images will allow for all fire scars to be mapped whereas using only Landsat data is not feasible. BLM – Alaska Service plans to use SAR images to update, and in some cases add, perimeters 100 acres and larger starting with the 2009 and 2010 fires and then continuing with future seasons.

Key Discussion Points & Questions:

- Rain during image acquisition can make data interpretation difficult.
- SAR is also linked to fire severity. The more severe the burn, the longer the fire scar will be visible on SAR images.
- No efforts are currently being made to correct fire scars prior to 2009.
- SAR perimeter mapping will not be used to digitize current fires during the season due to time constraints. Fire management areas and zones should continue to utilize aerial reconnaissance mapping and other mapping methods.

Additional Information:

View the presentation slides (pdf) or recording (wmv) on the Consortium website: http://frames.nbii.gov/alaska/consortium/workshops/oct2010

Alaska Research Needs List—What do you need to know?

Group Discussion

Requests for Alaska Fire Science Research Needs were distributed at the 2010 Interagency Fall Fire Review. The fire community was asked "What fire science information do you need to better manage your agency or program?" and returned with great results! All of the submitted research questions/topics were consolidated and divided into 12 main categories: *climate change, education/ information, fire behavior, fire danger, fire effects, fire regime, fuels, fuels treatments, predictive models, smoke, suppression tactics, and weather.*

The AWFCG Fire Research Development and Applications Committee will continue to consolidate and further develop the research needs along with solicit any additional feedback from their respective agencies. The goal is to complete this process by the first week of November, 2010. Then, with the help of the Consortium, the NEW 2010 Alaska Fire Research Needs List will be used to create a survey and will be distributed to the masses by the second week of November. This survey will be designed to allow the fire and research communities to vote on their top research needs category along with rank specific questions of interest.

The top Alaska Research Needs will be submitted to the Joint Fire Science Program for potential selection and development into one or more of the 2012 task statements. The Joint Fire Science Program annually sends out Requests for Applications (RFAs) on specific task statements (scientific questions or problems). They evaluate all submitted proposals and award the selected applicants with funding to complete the project.

To view the preliminary 2010 Fire Research Needs, go to the Alaska Fire Science Consortium's 2010 Workshop page (http://frames.nbii.gov/alaska/consortium/workshops/oct2010).

Brainstorming—The missing links in science delivery

Group Discussion

The first step in supporting management decisions is to understand the decision tree. Scientists and researchers need to know and understand what decisions are being made in the field to better develop a usable product. To complete the loop, constructive feedback needs to return from the field. This continuous feedback loop needs to function properly for both the fire and research communities to communicate effectively.

Suggestions were made to connect with the Alaska Fire Plan Working Group or link to the National Fire Plan in Alaska website which contains information on statewide hazardous fuels reduction projects. The Consortium should also incorporate more research from Canada and Russia. Another suggestion was to look into hosting a fire symposium poster session.

Photo by Diana Olson.

Suggestions on how the Alaska Consortium could be more effective:

- Record webinars for additional viewing and create one page summaries
- Create a blog for after webinars. Any questions or additional discussion with the presenter can be carried on via blog.
- Complete periodic 6-8 page research reviews written for managers.
- Host field trips to Nenana Ridge or similar on-going high profile projects in the fall allowing a firsthand look at why these projects are important and what has been gained from them.
- Create a list of on-going projects with links to contacts and additional resources/references.
- Advertise current fire tools/products and highlight their purpose and functionality.
- Update or create a product similar to the "Summaries of management and research activities related to Alaska's boreal forest" produced by the Alaska Northern Forest Cooperative in 2005.

Additional Information:

1. Alaska Fire Science Consortium: http://frames.nbii.gov/alaska/consortium
2. Summary of Management and Research Activities Related to Alaska's Boreal Forests: http://depts.washington.edu/nwfire/publication/ANFC_2005.pdf
3. National Fire Plan in Alaska: http://www.alaskafire.org/

Alaska Fire Science Consortium: Tech Transfer Update & Evaluations

Speaker
Sarah Trainor (UAF)

The 1st Annual Alaska Fire Science Consortium Workshop was held on October 16, 2009 and went off without a hitch! Over 60 participants attended the workshop from 10 different organizations. Two surveys were distributed at the workshop and posted on-line, the 2009 Technology Transfer Survey and the 2009 Workshop Evaluation. From these surveys, we found that web media is the number one place people look for fire information. The top 3 ways to distribute research results will be to create 1 page fact sheets to send via email, hold in-person workshops, and create 4-6 page newsletters to send via email. The 2009 workshop provided a great opportunity to share and discuss the latest fire science research amongst a very diverse audience though a larger space was recommended with better remote access.

Currently, the Consortium has a 2010 Technology Transfer survey available and encourages everyone to participate. These surveys are used to evaluate current fire science products/tools and help determine how the Consortium can better serve you. The 2010 Workshop Evaluation is also available to all participants. Let us know what you thought about this year's workshop and how it can be improved.

Additional Information:

1. Alaska Fire Science Consortium: http://frames.nbii.gov/alaska/consortium
2. Technology Transfer Survey: https://www.surveymonkey.com/s/ZNWCBPX
3. Workshop Evaluation: https://www.surveymonkey.com/s/Z5L5WFJ

Consortium Action Items!!

Several points of action were brought up at the 2010 Workshop that the Consortium plans to explore and/or implement:

1. Host a webinar on how the Pacific Decadal Oscillation relates to potential seasonal fire activity/area burned.
2. Investigate the potential of a product (spatial layer or list) which would incorporate all completed fuel treatment projects within Alaska.
3. Create a survey for the fire and research communities to rank their top fire science research needs.
4. Record webinars and create one page summaries
5. Create a list of on-going projects with links to contacts and additional resources and references
6. Advertise available fire tools/products and highlight their purpose and functionality.
7. Explore potential for hosting a fire science symposium or poster session.

November Updates

- The Consortium has added a *new calendar* (shown below) to their homepage. This calendar displays upcoming Consortium and other fire science events.
- If you missed Jill Johnstone's October webinar (Fire and forest dynamics in northern boreal forests), you can view the recording here: https://www1.gotomeeting.com/register/714985057
- Check out KUAC's coverage of the 2010 Workshop's presentation on Climate Change (given by Scott Rupp). http://frames.nbii.gov/documents/alaska/workshops/10-18-10_Fire_Story.mp3 (Copy & paste this link into your browser)
- Read the Consortium's article "Meeting Alaska's Fire Science and Climate Information Needs for Forest Managers" published in ***Forest Wisdom***: http://www.forestguild.org/publications/forest_wisdom/Wisdom16.pdf

Contact Information

For more information or questions on the content of this summary, the 2010 Workshop, or the Alaska Fire Science Consortium, please contact:

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Alaska Fire Science Consortium

The purpose of the Alaska Fire Science Consortium is to enhance ongoing fire science delivery by developing new mechanisms for outreach across the state of Alaska and to stimulate communication among researchers and managers to bridge the gap in information sharing.